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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/633,584	08/07/2000	Olivo G. Sivilotti	62801 CCD	3914

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[REDACTED] EXAMINER

KERNIS, KEVIN P

ART UNIT	PAPER NUMBER
1725	15

DATE MAILED: 04/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

<b>Application No.</b> 09/633,584	<b>Applicant(s)</b> SIVIOTTI ET AL.
<b>Examiner</b> Kevin P. Kerns	<b>Art Unit</b> 1725

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 10 March 2003.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-13, 15-43, 45 and 46 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-13, 15-43, 45 and 46 is/are rejected.
- 7) Claim(s) 18 and 46 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

<ol style="list-style-type: none"> <li>1)<input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2)<input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3)<input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.</li> </ol>	<ol style="list-style-type: none"> <li>4)<input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) _____.</li> <li>5)<input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</li> <li>6)<input type="checkbox"/> Other: _____.</li> </ol>
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## DETAILED ACTION

### *Claim Objections*

1. Claims 18 and 46 are objected to because of the following informalities: in claim 18, 10<sup>th</sup> line, "a" should be added before "cooling". In claim 18, 4<sup>th</sup> line from the bottom, "opining" should be changed to "opening". In claim 46, 9<sup>th</sup> line, "a" should be added before "cooling". In claim 46, 5<sup>th</sup> line from the bottom, "opining" should be changed to "opening". Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 35-43, 45, and 46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 35, it is unclear what limitations in the claim are pertaining to the nozzle itself, such that the nozzle is not being actively and distinctly claimed. In addition to other possible changes that would more clearly set forth the structural features of the nozzle, it is believed that the 2<sup>nd</sup> line of the claim should be changed to add "said nozzle" before "comprising" for further clarity.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-6, 8-13, 15-23, 25-43, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thorburn et al. (US 4,193,440) in view of Kush (US 5,363,902).

Thorburn et al. disclose a belt-cooling and guiding means for the continuous belt casting of metal strip in a twin belt caster having flexible endless belts, with the apparatus containing an array of removable, hexagonal, and planar guiding and supporting (elongated) nozzle elements facing (adjacent to) and beveled from the reverse surface of the belt at outer edges of the nozzle 48, which, in combination with liquid-withdrawal spaces (drainage areas, or gaps), form continuous slots of substantially uniform width between adjacent edges (abstract; column 1, lines 6-17 and 30-55; column 2, lines 1-25 and 44-61; column 3, lines 22-35; column 5, lines 28-46; column 6, lines 39-54; column 10, lines 1-44; and Figures 1-8). The coolant consists of a rapidly flowing layer (continuous uniform liquid film) of pressurized liquid with drainage openings covering less than 10% of the total belt surface, with the guiding face (surface) over which the coolant flows capable of moving a small amount angularly in any direction (column 2, lines 16-41; column 4, lines 13-19; column 8, lines 60-68; column 9, lines 1-8; and Figures 5-11). The multiplicity of nozzle elements are located in regions (42,44) adjacent upper and lower belts (20,21), respectively, such that the entire areas of the belts are covered by the guiding and cooling nozzle heads throughout the entire length of the mold space 22, thus contacting the reverse surface of the casting belt at a plurality of locations within the mold region and adjacent the mold entrance, as well as forming "point sources" downstream of a first nozzle (column 5, lines 47-68; and Figure

1). One of ordinary skill in the art would have recognized that the dimensions of the slots and bevels would be adjusted to conform to the spacing between a portion of the belt and each flat peripheral region of the nozzle faces, the depth and angles of concavity in the nozzle faces, and the water pressure (to obtain the fluid velocity), for the purpose of providing an optimum relationship between the belt, the water layer, and the nozzle faces. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the above parameters taught by Thorburn et al., since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thorburn et al. do not specifically disclose a continuous slot in the support surface arranged transversely substantially completely across the casting belt, as well as a vacuum system associated with the drainage opening.

However, Kush discloses a contained quench system for controlled cooling of a twin belt continuous casting machine, in which the apparatus contains a vacuum system in communication with drain pipes, as well as a plurality of webs containing slots that serve as cooling means and supports that are transverse to the casting belt (abstract; column 1, lines 6-10; column 3, lines 65-68; column 4, lines 1-28; column 5, lines 30-68; column 6, lines 1-35; and Figures 1-6). These additional features are advantageous for relieving pressure and containing quenching fluid from longitudinally escaping along the belt surface (column 5, lines 30-68; and column 6, lines 1-35).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the belt-cooling and guiding means in the

continuous caster of Thorburn et al., by adding the vacuum system in communication with the drain pipes, as well as a plurality of webs containing slots that serve as cooling means and supports that are transverse to the casting belt, as taught by Kush, in order to relieve pressure and to contain quenching fluid from longitudinally escaping along the belt surface (Kush; column 5, lines 30-68; and column 6, lines 1-35).

8. Claims 7 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thorburn et al. (US 4,193,440) in view of Kush (US 5,363,902) as applied to claims 1 and 18 above, and further in view of Dumont-Fillon et al. (US 3,799,239).

Thorburn et al. (in view of Kush) disclose all the elements of claims 1 and 18 above. Neither Thorburn et al. nor Kush specifically discloses the use of a filter for filtering particles from the cooling liquid.

However, Dumont-Fillon et al. teach a method for continuous casting of metal in which a filter is used for providing fresh coolant and cleaning recirculated spent coolant prior to flow into the supply conduit, which is shown to be conventional in the art, for the purpose of filtering particles that would build up in narrow orifices of each nozzle, which would be detrimental to uniform cooling (column 2, lines 53-67; column 5, lines 57-67; and column 6, lines 1-2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the belt-cooling and guiding means in the continuous caster of Thorburn et al., with the transverse continuous slots and vacuum system taught by Kush, in order to relieve pressure and contain quenching fluid from

longitudinally escaping along the belt surface, and further use the filtering means of Dumont-Fillon et al., in order to filter particles that would build up in narrow orifices of each nozzle, which would be detrimental to uniform cooling (Dumont-Fillon et al.; column 2, lines 53-67; column 5, lines 57-67; and column 6, lines 1-2).

### ***Response to Arguments***

9. The examiner acknowledges the applicants' request for continued examination (paper #13) and preliminary amendment/response (paper #14), both of which were received by the USPTO on March 10, 2003. New claim objections, as well as a new claim rejection under 35 USC 112, 2<sup>nd</sup> paragraph, are raised in paragraphs 1-3 above. The applicants have cancelled claims 14 and 44, while adding new claim 46. Claims 1-13, 15-43, 45, and 46 are now under consideration in the application.

10. Applicant's arguments filed March 10, 2003 have been fully considered but they are not persuasive.

With regard to the applicants' arguments on pages 6-14 of the applicants' preliminary amendment/response (paper #14) of March 10, 2003, the applicants have set forth that the 35 USC 103(a) rejection of Thorburn et al. in view of Kush does not suggest the applicants' invention. The examiner addresses the applicants' comments/arguments (in view of the amended independent claims) as follows:

On pages 6-8 of the amendment, the applicants have argued the rejection of independent claims 1 and 35, which are related to beveled regions 70 in Figure 5 of the

applicants' drawings. The examiner respectfully disagrees with the applicants' assertion that the geometric provisions of the applicants' beveled regions 70 define over Thorburn et al. (see paragraph 7 above for further discussion, in particular in the underlined portions that refer to the bevels at outer edges of the nozzle). The applicants are suggested to amend claims 1 and 35 to more distinctly define the bevels over the Thorburn et al. reference. On pages 8-14 of the amendment, the applicants have argued the rejection of independent claims 17, 18, and 46. As disclosed in paragraph 7 above (in the newly underlined portions therein), Thorburn et al. disclose the array of point cooling nozzles downstream from the first nozzle (claim 17) as well as contact of the reverse surface of the casting belt within the mold region, including a region immediately adjacent to the entrance of the casting mold (claims 18 and 46). Although Thorburn et al. lack the continuous slot arranged transversely in combination with a vacuum system, Kush discloses such features. When a continuous fluid flow reaches a steady state, as it would in the Kush process (as well as the Thorburn et al. process, which includes a rapidly flowing, water cooling layer over essentially the entire rear surface of each belt – column 9, lines 62-68), uniform flow in the form of a film/sheet would be achieved, as characterized by the inherent geometrically symmetrical features defined in each of the references. However, this "continuous film having substantially uniform thickness and velocity of flow" is merely a condition/functionality imposed upon the coolant itself (as achieved by the applicants' apparatus), not a structural feature as is required by the claims to distinguish over the references. This combination of references achieves motivation (from Kush) to relieve pressure and to contain

quenching fluid from longitudinally escaping along the casting belt surface (Kush; column 5, lines 30-68; and column 6, lines 1-35).

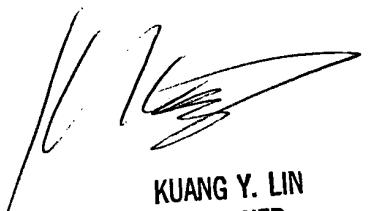
### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Kerns whose telephone number is (703) 305-3472. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KPK  
kpk  
April 12, 2003



KUANG Y. LIN  
EXAMINER  
~~GROUP 320~~

1725